Open Access and Institutional Repositories: Making Scholarship Global

Brian Rosenblum
University of Kansas
brianlee@ku.edu

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Abstract: The Open Access (OA) movement is gaining momentum and new initiatives are emerging around the world. The OA publishing model--making scholarly research available through OA journals and subject-based and institutional repositories--provides libraries and research institutions one of the most promising strategies yet for creating real change in the scholarly communication system. OA can not only address the economic concerns of the serials crisis, but can benefit the global scholarly community as a whole by facilitating the worldwide distribution of scholarship, thus helping to spread and increase the impact of research and knowledge on a global scale. This paper provides a general overview of the arguments for OA and some of the main obstacles to its development.

Keywords: Open access, scholarly communication, institutional repositories, globalization, publishing

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The growth of the Internet and related technologies is putting new pressures on our current scholarly communication systems, while at the same time creating opportunities for new models of scholarly communication that have a global reach and impact. Traditionally, scholarly journals have been published using a model which restricts and then charges for access. This was appropriate for print-based journals in which there was significant cost to produce and distribute each physical issue of a journal. In the world of the Internet, however, once an article is put on a server in electronic format, there is minimal cost to distribute the article to additional users. The cost of providing access to one person is the same as to a hundred people, or to a thousand. But publishers will often impose economic, technical or legal barriers to access in order to replicate the traditional publishing model in the electronic world.

Rather than making use of such barriers to access, the Open Access (OA) movement offers a model of scholarly communication that embraces, rather than resists, technology's potential to make scholarship available worldwide at minimal cost to readers. For the first time, it is possible to imagine a world in which scholarship is freely available to any user of the Internet around the world. The potential benefits of this are tremendous. John Willinsky, a professor of Sociology at University of British Columbia who has been one of the strongest and most articulate OA advocates in the past several years, writes: "with its proven ability to increase the circulation of research…open access strengthens the scientific claims of articles and overall quality of the research literature.

Open access to research literature may prove to be the most important scientific gain afforded by the Internet" (Willinsky, 2006).

Open access is gaining momentum quickly, and initiatives are emerging from all over the world, indicating the global nature of the movement, although there are also obstacles to growth of OA. This paper gives a general overview of some of the arguments for open access and some of the obstacles to it's development.

SCHOLARLY COMMUNICATION CHALLENGES

Before looking in more detail at the open access model and it's promise, it may help to summarize a few of the crucial challenges and concerns in the current scholarly communication environment.

The serials crisis. For decades the library community has been concerned about the vicious double-spiral of diminishing library budgets and rising journal prices, along with the increasing role of large commercial publishers in the scholarly communication process. The resulting economic pressures have come to be referred to as the "serials crisis"--an unsustainable state of affairs in which libraries spend increasing amounts of money to purchase less and less content (American Library Association, 2003).

The explosion of scholarly content. The sheer amount of scholarship being produced today and distributed in journals and non-traditional formats (working papers, conference proceedings, data sets, not to mention blogs, listservs and other informal venues) is so vast that even the richest libraries cannot afford to subscribe to it all.

Preservation of electronic content. While electronic publication provides a great convenience to library users and has transformed the way libraries provide services, there remain great concerns about long-term preservation and access to such materials. Digital content is fragile and requires active and ongoing efforts to keep it accessible over time. How can we ensure that a document we read online will exist and can be found one, ten or one-hundred years from now? (Waters, 2005).

New formats and forms of scholarship. Digital technology is not only changing scholarly publishing, it is enabling revolutionary changes in the way research itself is conducted. The pace of research is accelerating, and the amount of data being created each year continues to grow at exponential rates. More than ever, researchers work collaboratively across institutional and national boundaries, and new types of computational research, based on text and data-mining, are becoming increasingly common. Scholarly communication is no longer just about published articles, but also encompasses the need to describe, preserve and provide access to increasing amounts of data and scholarship in non-traditional formats. (Lynch, 2006; Hawkins, 2006; Carlson, 2006; Braman, 2006).

Intellectual property and copyright issues. Our copyright and intellectual property environment is increasingly restrictive, unfriendly to authors, and limits the way libraries,

scholars, teachers may use material. In our current model, authors typically give away all rights to their material to publishers. A typical publishing agreement requests, for example, that authors sign over "all copyrights and other intellectual property rights therein and all renewals and extensions thereof, in all formats and media, whether now known or hereafter developed, throughout the world in perpetuity" (Salo, 2006). Universities and other sponsoring institutions then need to purchase access to the very scholarship they produced. And with the move to electronic distribution, libraries don't purchase physical copies of the material, but only purchase *access* to it on remote servers through license agreements which often limit how the material can be used, and which may hinder efforts to ensure long-term preservation of this material. (Kenney, 2006; Fisher, 2006).

THE OPEN ACCESS MODEL

The open access movement has emerged as one response to these developments. While there are various definitions and "flavors" of OA, in general OA means making publications and research materials permanently available online to any user, preferably immediately upon publication, with no fees to access the material. In addition, there are minimal restrictions on use, copying, and redistribution. OA actually encourages such use, which makes "open" access significantly different from merely "free" access (Willinsky, 2003; Suber, 2006).

The two basic ways to make work available as OA are:

1) Publishing articles in OA journals . OA journals use new economic publishing models to make peer-reviewed content openly accessible immediately upon publication. BioMed Central (for profit), the Public Library of Science (non-profit) and the University of Michigan's Scholarly Publishing Office (non-profit, library-subsidized) are examples of OA publishers.

2) Author self-archiving. Self-archiving involves authors depositing copies of their work into open access subject-based or institutional repositories. Institutional repositories allow institutions to capture and preserve the intellectual output of an institution (published articles, unpublished preprints, working papers, conference presentations, data sets, teaching materials and other types of content). Subject-based repositories gather material in a specific subject area, regardless of the location of the authors. By using standard metadata formats and protocols, particularly the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH), repositories allow their metadata to be "exposed" to search engines and other web services, thus making them "interoperable" and making their content visible on the web to anyone using those tools, without the user having to know in which particular repository the content resides. Google Scholar and OAIster are two examples of search tools that provide access to repository content.

One of the longest running subject-based repositories is arXiv.org, a repository for papers in physics, math, computer science and biology established in 1991. Self-archiving has become the norm in some fields (such as physics and mathematics), while in most other

fields (especially in the humanities and social sciences) getting authors to self-archive their work still remains a challenge (Ware, 2004).

THE BENEFITS OF OPEN ACCSS

In addition to relieving the financial burden that libraries face in subscribing to the journal literature, there are several other main arguments for OA. Some of these are outlined briefly below:

Increased visibility, increased impact. Most authors publish scholarly articles not for financial payment, but to achieve greater impact and visibility of their work. By removing barriers to access and use, OA maximizes the potential circulation and global distribution of research. This benefits both readers and authors. Researchers and educators (as well as users outside the academy, such as professionals, journalists, policy-makers, independent scholars, or any other interested person) can have access to scholarship that their institutions or local libraries may not be able to afford. Greater distribution and access leads in turn to greater impact. Indeed, recent studies have shown that OA articles are downloaded and cited more often than non-OA articles (Eysenbach, 2006; Harnad & Brody, 2004). This benefits research institutions by making their activities more visible and influential (increasing the return on their financial investment), and benefits authors by increasing the visibility and citation rates of their work.

Scholarship as a public good: Greater global access to scholarship benefits the research and teaching community as a whole, and by extension society at large, by increasing the distribution of knowledge and the impact of scientific discovery. This argument sees scholarship as part of our common scientific and intellectual heritage--a public good whose benefits to society as a whole far outweigh the profits or losses of an individual publisher. This is especially compelling in the health and medical field, where lack of access to medical research in developing nations can be viewed as part of a growing global public heath crisis (Yamey, 2006).

Public policy: Results of publicly-funded research should be openly accessible because the public has already paid for the research, and shouldn’t be required to pay a second fee for access. In addition, as Peter Suber has argued, "tax money should be spent in the public interest, not to create intellectual property for the benefit of private publishers, who acquire it and profit from it without paying the authors or compensating the public treasury” (Suber, 2003).

Enables better oversight and preservation. While OA is not a preservation strategy in and of itself, it has a strong role in preservation programs. By freeing content from the restrictions of publisher licenses, OA can help the academic community take control of content and ensure that it is stored in standard formats in reliable preservation archives. Moreover, free, open access to all content "helps ensure the integrity of archived content through direct, active, and continuous use" (Kenney, 2006).

Enables new types of information and research. Placing research articles and accompanying data into a repository immediately makes it part of a worldwide corpus of dispersed text and data that can be indexed, searched and analyzed using emerging text- and data-mining technologies. These technologies cannot be applied efficiently to scholarship or data which is hidden behind technical, economic, or legal barriers (Swan, 2006).

OBSTACLES TO OPEN ACCESS

Most participants in the scholarly communication process agree in principle about the benefits of OA. In practice, however, there is still some debate about the economics of OA publication, and there continue to be a number of obstacles to the growth of OA journals and self-archiving in IRs. These obstacles are not so much technical as they are cultural, social or economic. Some of these obstacles are described below:

Resistance from publishers, new economic models: Many academic publishers (including nonprofit scholarly societies as well as large commercial publishers) feel under threat from OA because it challenges their current business models, which are based on controlling copyright to the content they publish. New business models are necessary for OA to thrive. Although there are examples of successful OA publishers (such as BioMed Central and the Public Library of Science) it is still unclear which business models will be most effective. However, as Paul Courant, former provost of University of Michigan (and an economist), points out: “Business models in which one can make money while giving away content (or making it easy to find) abound. Scholarship has always had that model” (Courant, 2006).

Although publishers have been largely resistant to OA initiatives, most of them, including large publishers such as Elsevier, recognize the growing demand for OA and do allow authors to self-archive either the preprint or final version of their own articles. According to the SHERPA project, which tracks the archiving policies of over 9300 journals from over 150 publishers, 76% of the journals tracked allow some form of author self-archiving (Sherpa/RoMEO, 2006).

Copyright and intellectual property concerns: Our restrictive and confusing copyright environment, including a rights clearing process that is costly and inefficient, is a significant obstacle to making previously published work openly accessible. Digital Rights Management (DRM) technologies and license agreements frequently restrict or make impossible legitimate educational uses of material. In addition, due to confusion, misunderstanding, or overly aggressive threats from commercial copyright holders, individuals and institutions are often excessively cautious when it comes to copyright issues (Fisher, 2006).

Lack of knowledge and understanding, time and effort. Many faculty members don’t clearly understand the immediate benefits of OA, and are reluctant to put time and effort into adapting new behavior patterns. Faculty authors don't have a solid understanding of their rights as authors, and don't understand their options for exercising their rights.

Although most publishers allow for some form of self-archiving in institutional repositories, most authors are unaware of this and don't know how to go about finding out (Ware, 2004; Foster & Gibbons, 2005; Andrew, 2003).

Tenure, promotion and merit for academic achievement: Most OA journals are too new to have established significant reputations (although there are several that have quickly established themselves as high-impact, highly regarded journals), and most tenure and promotion committees have yet to explicitly address issues of electronic publishing and "alternative" forms of scholarship. Scholars, ever mindful of tenure requirements and the clock ticking inexorably towards their tenure review, are thus concerned that OA journals may lack the same prestige as established traditional journals, and may be reluctant to publish in such venues (Ware, 2004).

FROM SUBVERSIVE PROPOSAL TO MAINSTREAM

OA is growing, and OA is global. Stevan Harnad first suggested self-archiving in 1994 in an Internet posting titled "A Subversive Proposal" (Harnad, 1994). Since that time the idea of self-archiving has evolved, along with the concept of open access, into an increasingly common scholarly publishing model that is receiving considerable interest from libraries, publishers, funding agencies and governments worldwide. There have been a number of "statements" in support of open access, the most well known being the Budapest Open Access Initiative (Open Society Institute, 2001) and the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities (Max Planck Society, 2003). Recently a group of scientists in Saudi Arabia issued the Riyadh Declaration on Free Access to Scientific and Technological Information (Second Gulf-Maghreb Scientific Congress, 2006).

As of October 2006, the Lund's University's Directory of Open Access Journals (DOAJ) lists 2444 open-access, peer-reviewed journals (Lund University Libraries, 2006), and commercial publishers have begun experimenting with "hybrid" journals which allow their authors to pay an optional fee to make their articles open access. OA has also caught the attention of legislators and funding agencies. Australia's Department of Education, Science and Training has just released a cost/benefit analysis on the economic effects of open access, and concluded that even a modest increase in open access publications will have a significant economic and social benefit (Lane, 2006). In the United States, the U.S. Senate is currently considering a bill called the Federal Research Public Access Act (or FRPAA) that would mandate open access to much of the research funded by the U.S. Government (Association of Research Libraries, 2006). Over 125 provosts of U.S. research universities have expressed support for this legislation (Association of Research Libraries, 2006a). The U.K.'s Wellcome Trust, one of the worlds largest funders of medical research, has already mandated that articles resulting from research it supports must be published in OA journals or deposited in OA repositories, and 5 of the 8 UK Research Councils have recently issued similar mandates. If these actions are effective in increasing the visibility and impact of their funders, then we may expect to see other funding agencies rapidly following suit.

OA and GLOBALIZATION

Although OA promises global benefits to readers, authors and research institutions, and has generated interest and action around the world, the pace of implementation is not uniform everywhere. Institutional repository development in Central and Eastern Europe, for example, is still weak. As of October 2006, of the 754 repositories listed in the Registry of Open Access Repositories, only 8 (about 1%) are in Central and East European countries, with another 4 (.5%) in Russia (Brody, 2006).

There is a significant opportunity for institutions and scholars in the region to take advantage of the benefits of open access, both as users and as producers of scholarly research. First, researchers, educators and other interested parties can take advantage of the increasing amounts of research produced elsewhere in the world and openly accessible. Libraries should educate themselves as well as their users about OA and the emerging tools to access OA content. Secondly, libraries, research institutions or other organizations can strengthen their support for making their own research available in OA journals and institutional repositories. This will make the research output of their faculty and researchers more easily discoverable and available to others, thus increasing their visibility and presence on the global stage.

However, as institutions in Central and Eastern Europe (and elsewhere) move forward with OA and IRs, it is important to remember that scholarly communication is a social act that takes place in a specific cultural context. Different cultures have their own traditions of scholarly communication and academic conventions, which may be reflected in a wide variety of facets or academic culture. For example, cataloging practices, reward systems or standards for academic performance, the history of cooperation (or lack of it) between academic institutions, or the value users place on information--issues such as these may vary from region to region and should be taken into account when planning or creating OA-related initiatives. To explore this topic in detail is outside the scope of this presentation, but a good starting point can be found in the works of researchers such as Christine Borgman, Nadia Caidi, and Andrew Lass, who have all done work in Central and Eastern Europe and written on how cultural and social contexts come into play (and can affect the success of a project) when new technologies, such as library automation or designing digital library content and interfaces, are introduced. (Lass, 1997; Caidi, 2001, 2006; Borgman, 2000, 2000a). As scholarly communication and research becomes more global, and as local traditions meet on the global stage, how libraries and scholars everywhere strive to balance local traditions and global standards will be an interesting and important area for further investigation and study.

CONCLUSION

The broad overview of OA issues presented above is generic in that it does not distinguish between significant disciplinary differences in scholarly communication traditions (such as the differences between the humanities and hard sciences), nor does it distinguish between the traditions of countries or geographic regions. Nevertheless, as a general model, open access--through OA journals and subject-based and institutional

repositories-- provides libraries and research institutions one of the most promising strategies yet for creating real change in the scholarly communication system. OA can not only address the economic concerns of the serials crisis, but can benefit the global scholarly community as a whole by facilitating the worldwide distribution of scholarship, thus helping to spread and increase the impact of research and knowledge on a global scale.

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